

REMARKS

Applicants concurrently file herewith an Excess Claim Fee Payment Letter, and corresponding excess claim fee, for two (2) excess total claims.

Claims 1 and 3-23 are all of the claims presently pending in the application. Claims 1 and 3-12 have been merely editorially amended and have not been substantively amended.

Claims 13-23 have been added to claim additional features of the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1, 3-8, 11 and 12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Yoshimura, et al. (U.S. Patent No. 6,343,171 B1; hereinafter “Yoshimura”). Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshimura in view of Nishiwaki, et al. (U.S. Patent No. 5,200,939; hereinafter “Nishikawa”). Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshimura, et al., in view of Sizer, II, et al. (U.S. Patent No. 5,416,872; hereinafter “Sizer”).

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g. as defined by exemplary claim 1) is directed to an optoelectronic hybrid integrated module. The module includes an optical device for converting one of an optical signal into an electric signal and an electric signal into an optical signal, an input/output IC for drive-controlling the optical device, and a transparent base material having electric wiring and light permeability. The optical device and the

input/output IC are flip-chip mounted on a surface of the transparent base material, where light inputting/outputting between the optical device and an outside of the module is carried out due to the light permeability of the transparent base material, and the electric wiring electrically connects the optical device and the input/output IC so as to transfer an electrical signal between them. The electric wiring is position on a surface opposite to a surface where the optical device is mounted and is provided as a ground electrode and serves as an electromagnetic shield for the optical device and the input/output IC.

In conventional optoelectronic hybrid integrated modules an optical device for transmitting and receiving optical signals is connected to a wiring substrate by a metal wire. A driver IC for adjusting a current amplitude of the optical device is also electrically connected to the wiring substrate by a metal wire. A case is mounted on the wiring substrate and a light coupling means is formed on the case. This causes a problem of an increase in the number of components and processes and an increase in the mounting cost. Additionally, high-density mounting of the components becomes difficult.

The claimed invention of exemplary claim 1, on the other hand, provides an optoelectronic hybrid integrated module wherein the optical device and the input/output IC are flip-chip mounted on a surface of the transparent base material (e.g., see Application at Figure 1 and page 4, line 25 through page 5, line 11). This allows the number of components and processes of the module to be reduced so that mounting costs can be suppressed (e.g., see Application at page 5, lines 20-23).

II. PRIOR ART REFERENCES

A. The Yoshimura Reference

The Examiner alleges that Yoshimura teaches the claimed invention of claims 1, 3-8, 11 and 12. Applicants, however, respectfully submit that Yoshimura does not teach or suggest each and every feature of the claimed invention.

That is, Yoshimura does not teach or suggest "*wherein the optical device and the input/output IC are flip-chip mounted on the transparent base material*", as recited in exemplary claim 1 and similarly claim 12.

The Examiner attempts to rely on Figure 2 and column 7, line 65 through column 8, line 1 of Yoshimura to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in this figure nor this passage (nor anywhere else for that matter) does Yoshimura teach or suggest that the optical device and the input/output IC are flip-chip mounted on a surface of the transparent base material.

According to Yoshimura, the optical device is disposed between transparent base materials (waveguides). In other words, the optical device is not mounted on the transparent base material.

Indeed, Yoshimura merely teaches that the IC chips (1) are flip-chip mounted on a surface of the transparent base material (e.g., see Yoshimura at column 5, lines 29-32). In contrast, the opto-electronic devices (26 and 28) are merely embedded in the active layer (20) (see Yoshimura at column 5, lines 34-39). Thus, the optical device of Yoshimura is not even mounted on a surface of the transparent base material, let alone flip-chip mounted on a surface of the transparent base material, as recited by the claimed invention. Therefore, the optical device of Yoshimura is clearly not flip-chip mounted on a surface of the transparent base material.

Moreover, Yoshimura does not teach or suggest that “*light inputting/outputting between the optical device and an outside of the module is carried out due to the light permeability of the transparent base material*”, are recited in exemplary claim 1 and similarly claim 12.

Indeed, Yoshimura is not even directed to light inputting/outputting between the optical device and an outside of the module. The Examiner does not even allege that Yoshimura teaches or suggests this feature.

Indeed, the claimed invention recites that light may be input and output between the optical device (11) and the outside of the module through the transparent base material (13) (e.g., see Application at Figure 1). According to a certain exemplary aspect of the claimed invention, the light may be input and output through a light extracting part (14) of the transparent base material (13).

In stark contrast, Yoshimura merely teaches that a light power source is brought into the substrate (10) through an optical fiber (4) and is coupled to the optical waveguide (24). The light from the waveguide is routed to an opto-electronic switch (26a) and is then coupled to an IC chip (1d). From the switch (26), modulated light is again routed to the waveguide (24), which terminates in an optical fiber (5) (see Yoshimura at column 5, line 40 through column 6, line 36). Nowhere, however, does Yoshimura teach or suggest inputting or outputting light between the optical device and the outside of the module, let alone teach or suggest that the light inputting/outputting between the optical device and an outside of the module is carried out due to the light permeability of the transparent base material.

Indeed, Yoshimura combines waveguides and fibers to convey light. In contrast, the claimed invention does not use a waveguide to transmit light to/from the outside.

Furthermore, nowhere does Yoshimura teach or suggest that the electrical wiring “*serves as an electromagnetic shield for the optical device and the input/output IC*”, as recited in exemplary claim 1, and exemplary dependent claim 22.

Indeed, the Examiner attempts to rely on column 7, line 65 through column 8, line 1 of Yoshimura to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in this passage (nor anywhere else for that matter) does Yoshimura teach or suggest that the electrical wiring serves as an electromagnetic shield for the optical device and the input/output IC. Indeed, this passage of Yoshimura merely states that “[s]hort electrical traces, which are not present in the cross-sectional plane of FIG. 2, connect electrodes 27 to respective connection pads 32, which are not present in the cross-sectional plane of FIG. 2 but whose locations in back of the plane are shown by dashed lines” (see Yoshimura at column 7, line 65 through column 8, line 1) (emphasis included in Yoshimura). Indeed, this passage of Yoshimura does not provide any support for the Examiner’s allegations.

Furthermore, electrodes, especially GND electrodes, are arranged in the backside of a transparent base material, which is part of a electromagnetic shield structure. The electromagnetic shields cannot be composed without a purpose. Thus, the electromagnetic shield cannot be attained with the structure of Yoshimura.

Therefore, Applicants respectfully submit that Yoshimura does not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested the reconsider and withdraw this rejection.

B. The Nishiwaki Reference

The Examiner alleges that Nishiwaki would have been combined with Yoshimura to

teach the claimed invention of claim 9. Applicants respectfully submit, however, that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention.

That is, neither Nishiwaki nor Yoshimura, nor any combination thereof, teaches or suggests “*wherein the optical device and the input/output IC are flip-chip mounted on the transparent base material*”, as recited in exemplary claim 1 and similarly claim 12.

Applicants respectfully submit, as detailed in section A of the present Amendment, that Yoshimura does not teach or suggest this limitation. Furthermore, Applicants respectfully submit that Nishiwaki does not make up the deficiencies of Yoshimura.

The Examiner attempts to rely on the Abstract of Nishiwaki to support his allegations. The Examiner, however, is clearly in correct.

That is, nowhere in the Abstract (nor anywhere else for that matter) does Nishiwaki teach or suggest that the optical device and the input/output IC are flip-chip mounted on a surface of the transparent base material. The Examiner does not even allege that Nishiwaki teaches or suggests this feature. Indeed, the Examiner merely relies upon Nishiwaki as teaching light emitting through a substrate wherein the polarization of the optical signal is rotated.

Moreover, Nishiwaki (taken alone or in combination with Yoshimura) does not teach or suggest that “*the transparent base material includes an optical axis converter which converts a direction of an optical axis with reference to the light coupling means*”, as recited in exemplary claim 9.

Indeed, Nishiwaki is merely directed to an optical head apparatus. The polarization rotator of Nishiwaki does not teach or suggest the optical axis converter of the claimed invention.

Thus, Nishiwaki fails to make up the deficiencies of Yoshimura.

Therefore, Applicants respectfully submit that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

C. The Sizer Reference

The Examiner alleges that Sizer would have been combined with Yoshimura to teach the claimed invention of claim 10. Applicants respectfully submit, however, that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention.

That is, neither Sizer nor Yoshimura, nor any combination thereof, teaches or suggests "*wherein the optical device and the input/output IC are flip-chip mounted on the transparent base material*", as recited in exemplary claim 1 and similarly claim 12.

Applicants respectfully submit, as detailed in section A of the present Amendment, that Yoshimura does not teach or suggest this limitation. Furthermore, Applicants respectfully submit that Sizer does not make up the deficiencies of Yoshimura.

The Examiner attempts to rely on Figure 2 of Sizer to support his allegations. The Examiner, however, is clearly in correct.

That is, nowhere in this figure (nor anywhere else for that matter) does Sizer teach or suggest that the optical device and the input/output IC are flip-chip mounted on a surface of the transparent base material. The Examiner does not even allege that Sizer teaches or suggests this feature. Indeed, the Examiner merely relies upon Sizer as teaching an interposer as a heat spreader.

Thus, Sizer fails to make up the deficiencies of Yoshimura.

Therefore, Applicants respectfully submit that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. NEW CLAIMS

New claims 13-23 have been added to provide more varied protection for the claimed invention and to claim additional features of the invention. These claims are independently patentable because of the novel and non-obvious features recited therein.

Applicants respectfully submit that claims 13-23 are patentable over any combination of the applied prior art references at least for analogous reasons to those provided above regarding claims 1 and 3-12.

IV. FORMAL MATTERS AND CONCLUSION

In accordance with the Examiner's objections, the Abstract, the Specification and the claims have been amended.

Regarding the Examiner's objection to the Specification, Applicants have replaced each and every instance of the term "forth" with the correctly spelled term "fourth".

Regarding the Examiner's objection to the Abstract, Applicants have amended the Abstract to remove the drawing reference numerals. Applicants have reviewed the Abstract and respectfully submit that the amended Abstract provides a clear and concise summary of the invention, does not exceed 150 words and does not include legal phraseology. If the Examiner wishes to maintain his objection to the Abstract, Applicants respectfully request the Examiner to specifically point out which portions of the Abstract the Examiner asserts are not "clear and concise".

In view of the foregoing, Applicants submit that claims 1 and 3-23, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,



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